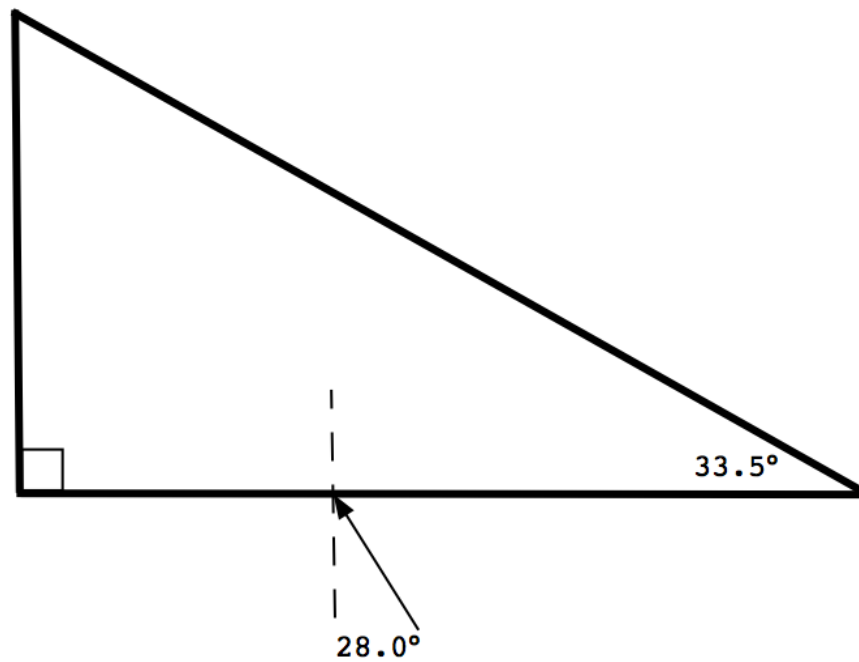


## **Physics 10164 - Exam 3B**

Partial credit will be given provided you show all work and are solving parts of the problem correctly. Points will be deducted if you don't show your work even if you get the right answer. Clearly indicate your answer with a circle or a box and remember to include correct units and significant figures.

1. (25 pts) A person stands 1.7 meters away from a mirror and sees an inverted image of himself that is 40% of his actual height. If he wants to see an upright image of himself in the same mirror that is 50% larger than this actual height, how close must he stand to the mirror?

2. (25 pts) Light is incident on the bottom edge of a triangular prism as shown below. The prism is surrounded by air and made from a substance with  $n = 1.55$ . Through what face does the light exit the prism and with what exit angle of refraction?



3. (25 pts) A person has a near point of 24 cm and a far point of 48 cm. Glasses are used to correct this person's far point to a normal far point of infinity, and the glasses are 2.0 cm in front of the eye.

- a) What must be the focal length of the lenses in order to correct the far point?
- b) With these glasses, what is the new near point for the person?

4. (25 pts) A thin film ( $n = 1.40$ ) is applied to a glass surface ( $n = 1.50$ ). The coating has a thickness of 790 nm.

- a) If light with a wavelength in air of 632 nm is incident on this setup, does this light experience constructive or destructive interference (or some intermediate condition) upon reflection? Justify your answer.
- b) Answer part (a) again assuming the glass surface has an index of refraction of  $n = 1.35$ .